

THE EFFECT OF PHYSICAL EDUCATION TEACHER PHYSICAL  
APPEARANCE ON STUDENT PHYSICAL ACTIVITY

by

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## ABSTRACT

The purpose of this study was to examine how perceptions of a physical educator's physical appearance affected student physical activity levels through the use of pedometers. It was hypothesized that students with a fit-appearing teacher would have higher step counts than students with an overweight-appearing teacher. Both male and female students ( $N = 142$ ) from fourth-, fifth-, and sixth-grade physical education classes wore pedometers during physical education class. Initially, students completed a Figure Rating Scale that rated a set of two cartoon figures in order to determine weight bias. A Zumba lesson was taught by one female guest teacher who wore a fat suit for half of the classes and no fat suit for the other half of the classes separately. Following the lesson, students completed a Student Attitude Questionnaire regarding the guest teacher and asked to record step count from their pedometer. A  $3 \times 2 \times 2$  ANCOVA data analysis revealed a statistically significant grade  $\times$  group interaction ( $F [2,129] = 6.48, p = .002, \eta^2 = .091$ ). The covariate Student Attitude Questionnaire showed statistical significance ( $F [1, 129] = 9.23, p = .003, \eta^2 = .067$ ). The results of this study showed that the fourth graders had a higher step/min. in the group with the fit-appearing teacher and lower step/min. in the group with the overweight-appearing teacher. However, it was the opposite with the sixth graders, as the group with the fit-appearing teacher had lower step/min. than the group with the overweight-appearing teacher. The results of this study indicate that a fit teacher appearance may have a greater direct relationship with fourth-

grader physical activity, but fit-appearing teachers may actually relate to lower levels of physical activity in sixth graders. These phenomena may be influenced by preactivity weight bias in children.

## TABLE OF CONTENTS

ABSTRACT.....	iii
INTRODUCTION.....	1
Role Modeling.....	1
Physical Appearance and Weight Bias.....	4
METHODS.....	8
Participants.....	8
Instrumentation.....	9
Procedures.....	11
Data Analysis.....	12
RESULTS.....	14
DISCUSSION.....	19
Limitations, Application, and Conclusion.....	23
APPENDIX.....	27
REFERENCES.....	32

## INTRODUCTION

More than one-third of adults in the United States (U.S.) are considered obese (CDC, 2016), and in 2015, there were no longer any states in the U.S. with a prevalence of obesity less than 20% (CDC, 2015). This is not only problematic for the obese adults, but also has strong negative effects on children. The bodies and behaviors of adults may determine the academic and health futures of students (Schee & Gard, 2014). Adults are role models to youth in both behavior and action. Role modeling is no different when it comes to physical health. Specifically, adult physical and health educators and coaches are role models of good health (Cardinal, 2001). According to Wilmore (1982), physical educators communicate so much more by who they actually are as compared to what they actually say. Therefore, the physical appearance of a physical/health educator may play a role in youth learning and physical activity. It is hard to expect students to care about fitness, active lifestyles, and skillful performance when the teaching is done by unfit, inactive, and low-skilled teachers (Mitchell, 2007). Thus, teachers should emulate the characteristics that they teach and be healthy role models inclusive of a fit physical appearance.

### *Role Modeling*

Research has shown the many different aspects that a physical educator role model can play. An example is found in Gold, Petrella, Angel, Ennis, and Woolley

(2012) where it states that physical educators should exhibit the behaviors and appearances that are consistent with the message they teach of healthy living. There is also evidence in the literature that states what the expectations are for physical education teachers and what is thought necessary for a successful role model. One example of this is from McCullick (2001), who had practitioners share their perspectives on what the necessary characteristics might be for participants in a Physical Education Teacher Education (PETE) program. The study mentions physical fitness as one characteristic that teachers should possess because they should be role models for students and the teachers should be able to adequately perform in sport-related activities. Body composition is one component of physical fitness and inherently incorporates physical appearance. The study also addressed student needs and explained that the teacher is similar to a salesperson for fitness. If students can tell that the teacher takes fitness seriously, then those students will be more inclined to do so as well (McCullick, 2001). Student inclination to perform healthy behaviors should be at the forefront of every physical educator and visible in their physical appearance.

The rationale that physical educators often model behaviors that they want students to learn is helpful to the current study and is found in the Social Learning Theory (Bandura, 1977). This theory explains the vital role that a significant person in one's life can have on the development of behaviors and attitudes. Bandura states that learning can occur vicariously through the observation of another person's behavior, and that most of people's behaviors are learned, either deliberately or inadvertently, through the influence of example (1977). This is fundamental for this study in order to understand that, according to Bandura (1986), the behavior and attitude of a teacher can affect the



behavior and attitude of a student through modeling. This behavior includes, as mentioned above, physical fitness and therefore includes body composition as one component. Cardina (1994) also mentions that Social Learning Theory can be useful for educator's because it addresses a broad collection of variables that influence behavior change and not just on individual's motivation for behavior change.

There is a unique opportunity for physical/health educators to have a positive impact on youth during the school day. Melville and Hammermeister (2006) mention that future physical education teachers will be required to lead their schools and communities in order to aid in the process of regular physical activity, better eating habits, and create a more positive ideology surrounding health as a whole. Wilmore (1982) discussed how those in the profession must make personal commitments to have their own levels of physical fitness in the healthy zone for the promotion of these healthy zones for students, the focus for this study being the component of body composition and physical appearance of such. Students will possibly be most successful when leaders in schools are role models to everyone around them by living healthy and practicing what they teach. Another article also reiterates that academic achievement is accomplished when the teachers themselves are healthy and can inspire good health among the children that they teach (Schee & Gard, 2014). The link between academic achievement and healthy teachers further supports the importance of teachers' ability to inspire good health among their students with physical appearance being one component and the focus of this study.

### *Physical Appearance and Weight Bias*

The effects of physical appearance have been studied in other circumstances such as medical residency applicants (Boor, Wartman, & Reuben, 1983), teacher education majors (Buck & Teine, 1989), hospital-based nurses (Zapka, Lemon, Magner, & Hale, 2009), physicians (Hash, Munna, Vogel, & Bason, 2003), sport psychology practitioners (Lubker, Visek, Watson II, & Singpurwalla, 2012), and sports dietitians (Lovell, Parker, & Slater, 2013). Only a small amount of research has been done on physical education teachers' physical appearance and how it can affect student outcomes for physical activity. The existing research covers the area of cognitive skills that students have and how physical appearance influences these cognitive skills or abilities (Conlin 2010; Dean, 2005; Melville & Maddalozzo, 1988; Thomson, 1996).

One foundational study has been published regarding a physical education teacher's physical appearance and/or fitness level. This study, by Melville and Maddalozzo (1988), used the physical appearance of one male physical education teacher to determine the effect of teaching success on the students. They used instructional videotapes of a physical education teacher during a physical education lesson. The lessons were identical, except that one lesson was taught by the instructor as himself, who was seemingly fit. The other lesson was taught by the same instructor teaching the same lesson except he wore a fat suit and was seemingly overweight. This study found that physical education teachers' physical appearance did actually have an effect on student success, and more specifically that students performed lower on the exam with an overweight-appearing teacher (Melville & Maddalozzo, 1988).

Another study, by Thomson (1996), was a replication study of the above-

mentioned study by Melville and Maddalozzo (1988); however, instead of measuring student success on an exam, Thomson measured student success on a 15-item quiz. Results from this study supported the research and showed differences between a fit and an unfit-appearing teacher on student success, which resulted in students performing higher on the quiz with a fit-appearing teacher.

A more recent study done by Dean (2005), examined how a female physical educator's physical appearance affected the cognitive performance of junior high school students. This research made the investigation a longer, 6-week, period of teaching time, as compared to the previously mentioned studies, which were only one physical education class period. Results of this study also support the other studies concluding that a teacher's obese physical appearance does negatively affect junior high students' test scores on health-related fitness knowledge (Dean, 2005).

A dissertation by Conlin (2010) investigated if student test scores changed when content knowledge was delivered by average-appearing female and male physical education teachers compared to overweight-appearing female and male physical education teachers. The results were not the same, however, and there was no significant main effect for student test scores on fitness knowledge tests when taught by average-appearing physical education teachers or overweight-appearing physical education teachers. Conlin speculated that the students may not have been exposed to healthy-weight adults and may have an altered view of what a healthy role model should appear to be in general, especially based on physical appearance alone, and there would have been no negative association with teachers who might appear overweight (2010). This research is contradicting to the previous results, but is also 10 years advanced and the

overweight and obesity prevalence has since changed. Research needs to address this issue, contradicting results or not, to stop this obesity trend and create healthy role models for students today.

However, in an area of study that focuses on physical activity the majority of the time, there is no research done on how the physical appearance of a physical education teacher affects the physical activity levels of students. The current study measured the students' physical activity levels rather than exam performance and quiz performance as previous studies have done. The activity levels of students were measured using pedometers, to keep track of step counts for each individual student. Weight bias was also measured in the students. Weight bias is the inclination to form judgements that are unreasonable because of a person's weight (Washington, 2011). The weight bias of students was measured in order to assess whether or not a preconceived bias of weight would affect the students' physical activity levels. Findings from Andreyeva, Puhl, and Brownell (2008) showed that weight/height discrimination has increased and the prevalence is comparatively close to reported rates of race and age discrimination. The reduction of weight bias is needed in order to protect the population of obese and overweight individuals at all age levels. By measuring weight bias in students, it is possible to analyze the effects that the bias potentially has on physical activity behaviors. This weight bias in students might also be a possible reason why physical educators' appearance might influence physical activity, possibly resulting in why students would have a poorer attitude towards overweight teachers.

It is apparent that more evidence is needed to determine whether a physical education teacher's appearance actually can influence students' physical activity levels.

Therefore, the purpose of the study was to examine how the perception of a physical educator's physical appearance affected student physical activity levels through the use of pedometers. Within a social-cognitive theoretical framework, it was hypothesized that students with the fit-appearing teacher would have higher step counts than those students with the overweight-appearing teacher.

## METHODS

### *Participants*

All participants (students) were recruited from an elementary school in the Salt Lake valley and participated in the study, which took place in their physical education class using a convenience sampling procedure. Students were recruited from fourth-, fifth-, and sixth-grade classes and ranged in age from 9-13 years old. This took place during the school day and all students in the above-mentioned parameters were included (151 students). IRB approval and district approval were obtained prior to data collection, and parental/guardian permission forms for the students, which explained the study and the data to be collected, were given out at school and sent home with the students. This allowed parents/guardians and students to choose if the student wanted to opt out of participating in the study. Consent forms were also given to parents/guardians, administrators, and teachers to inform them of study procedures and protocol.

One female teacher participated in the study as the physical education class teacher. The teacher was chosen based on her seemingly fit appearance with a weight of 170 pounds and a height of 6 feet tall. These dimensions equated to a normal weight Body Mass Index ( $BMI = 23.1$ ). The guest teacher taught a Zumba fitness lesson to the physical education classes involved. The lesson was an incorporation of dance, plyometric cardio, rhythm, and stretching with accompanying music. Half of the classes ( $n = 3$ ) saw her as her true fit-appearing self, and the other half ( $n = 3$ ) saw her as an

overweight-appearing educator through the use of a fat suit worn underneath her clothing. The fat suit was a padded garment that added pseudo-fat tissue to the torso region of the body. Measurements for the teacher were taken in her fit state and overweight state. The results of this were a 35-inch chest, 32-inch waist, 38-inch hips, 22-inch thighs (left and right), and 12-inch arms (left and right) for fit-appearing. For overweight-appearing, the measurements were 35-inch chest, 38-inch waist, 40-inch hips, 22-inch thighs (right and left), and 12-inch arms (right and left). Her lessons were structured the exact same for each class, and her mannerisms and teaching style remained the same for each class. This was to ensure that all the students received the same opportunity to be physically active and to ensure that the only changing variable was the teacher's appearance. She also wore a pedometer throughout the data collection to ensure that her own physical activity levels remained the same throughout all the lessons, fat suit or no fat suit.

### *Instrumentation*

A student attitude and behavioral intention questionnaire (Melville & Maddalozzo, 1988) was used to assess the attitudes students had towards the physical educator. This questionnaire was based on a 5-point Likert scale with 8 items. This instrument was previously created and used by Melville and Maddalozzo (1988), as well as in other studies (Conlin, 2010; Dean, Adams, & Comeau, 2005). The questions used for this study were: 1) I think I would like having (teacher name) as a physical education teacher, 2) (teacher name) knows a lot about physical education, 3) a physical education teacher should be physically fit, 4) (teacher name) appears physically fit, 5) I will try to use the information (teacher name) talked about to improve my own physical fitness, 6) I

believe (teacher name) leads a healthy lifestyle, 7) I think (teacher name) exercises regularly, 8) (teacher name) motivates me to exercise and lead a healthy lifestyle. The scale for these questions was 1=strongly disagree, 2=disagree, 3=don't know or uncertain, 4=agree, or 5=strongly agree.

Pedometers (CW-701 Yamax Digiwalker) were used to measure step counts through ambulatory movement for individual students. These assessment tools provided a valid and reliable assessment tool for measuring ambulatory activities (Welk, 2002). The pedometer device was worn near the thigh midline of the waist/hip area of each student and connected to a belt or clothing. Behrens, Hawkins, and Dinger (2005) mentions that this specific brand is one of the most accurate pedometers for the collection of step count data.

An adapted version of the Figure Rating Scale (Stunkard, Sorenson, & Schulsinger, 1983) was used to provide an assessment of weight bias that students might have had before they saw the PE teacher used in this study. The students were asked to rate two figures, one fit-appearing and one overweight-appearing, and answer the question "how good of a P.E. teacher do you think each of these people would be?" This was done similarly in the study by Tiggemann and Wilson-Barrett (1998). The two figures were not actual pictures of real people, but rather were drawn depictions of cartoon people. The scale used was 1=very bad, 2=bad, 3=neither bad or good, 4=good, or 5=very good. Change score was used, which can be interpreted as the difference score. Therefore, a higher change score equated to higher weight bias due to students choosing higher and lower scale scores for each figure.



### *Procedures*

The week of the data collection, students were given a pedometer as they came into their physical education class in the gymnasium. They were then instructed to wear the pedometer for the entire class time and not to mishandle or misuse it in any way. Steps were recorded by the students after the physical education class lesson was finished and were then used to examine the difference in step counts and activity levels between a fit-appearing teacher and an overweight-appearing teacher. Pedometers were collected at the end of the class time.

Preliminary Figure Rating Scale questionnaires were given to students before the week of data collection. This allowed students to provide the author with a measure of weight bias for the study and see what they thought a physical education teacher should look like as a role model. These data were then used to see the influence of weight bias on the students and their perceptions of their teacher. The scale questions were given to students in a separate physical education class time, not during pedometer data collection.

During the week of data collection, a questionnaire was given to students at the end of their physical education class time with questions based on the Likert scale to determine how they thought and felt about their teacher. The students also recorded individual step counts on the same questionnaire through self-report.

A fat suit was worn by the guest physical education instructor during one class of one grade and then again with the other class of the same grade the fat suit was not worn. This was done for each grade level of classes, which totaled six lessons. Lessons were taught the same by the guest instructor, monitored by the teacher's pedometer, and the lesson topic was on Zumba fitness in order to give the students a higher opportunity to

move and be physically active. The teacher was a certified Zumba instructor and used the same routine and music for each lesson. The guest teacher was also given full autonomy to instruct as if the class was her own, with little interaction from the resident teacher.

### *Data Analysis*

Means for total physical education class step counts were computed. To control for pedometer wear time, step rate was computed by dividing mean steps by physical education lesson wear time in minutes. A complete or valid day required the child to wear his/her pedometer the entire class period without taking it off. Data was screened for outliers using boxplots and influential cases using Cook's distance while also checking for Gaussian distributions using k-density plots. A quasi-experimental design was employed and, therefore, there was no random assignment due to class scheduling.

A 3 x 2 x 2 analysis of covariance (ANCOVA) test was used to examine the effect of grade level (fourth, fifth, and sixth grades), sex (male and female), and condition of physical education teacher (fat suit or no fat suit) on physical education lesson step rate, controlling for the effect of weight bias, which was used as a covariate. The Figure Rating Scale (weight bias measure) score was calculated as the change score, or the difference between the two scores. The higher the change score, the higher the weight bias. The mean scores for the student attitude questionnaire were also used as a covariate. The assumption of homogeneity of regression slopes were examined to determine if the use of weight bias as a covariate is valid. Bonferroni post hoc test was not employed because a grade main effect was not found.

To help partially explain the potential findings, additional exploratory analyses

were employed. A one-way analysis of variance (ANOVA) test was used to examine the effect of Figure Rating Scale change score (difference score) on grade level (fourth, fifth, and sixth grades). An additional one-way ANOVA test was used to examine the effect of Figure Rating Scale change score on sex (male and female). A one sample *t*-test was also conducted to compare the scores of the Figure Rating Scale for the overweight-appearing teacher and the fit-appearing teacher. The Student Attitude Questionnaire scores were analyzed by group, grade, and sex using one-way ANOVA analyses. All analysis used an initial alpha level of  $p \leq 0.05$  and was analyzed using SPSS v.23.0 statistical software package (Armonk, NY, USA).

## RESULTS

Of the 151 students in all 6 classes combined, 142 of the students had complete, usable data (94%). All data were retained due to the lack of extreme and influential cases within the data set. Assumption issues were attenuated due to the relatively large sample size. There were more female students ( $n = 78$ ) than male students ( $n = 64$ ). The participants were mostly in the fifth grade ( $n = 54$ ), followed by fourth grade ( $n = 48$ ), and least in sixth grade ( $n = 40$ ). The number of students with an overweight-appearing teacher was almost identical to the group with a fit-appearing teacher ( $n = 72$ ;  $n = 70$ ). Descriptive statistics results can be found in Table 1.

Results for the ANCOVA revealed that the covariate Student Attitude Questionnaire (SAQAVG) showed statistical significance ( $F [1, 129] = 9.23, p = .003, \eta^2 = .067$ ). Results can be found in Table 2. The covariate significantly predicted steps per minute. Therefore, the step counts per minute were influenced by the Student Attitude Questionnaire averages. The corrected model and the intercept were also statistically significant; however, no other main effects were statistically significant. The second covariate, Figure Rating Scale change score, was also tested for significance, but was not statistically significant ( $p = .759$ ).

Table 1 Descriptive Statistics for each group steps/min. by sex

Sex	Group	Mean	Standard Deviation	<i>N</i>
Female (0)	Fit (0)	60.69	26.13	39
	Overweight (1)	68.45	19.04	39
Male (1)	Fit (0)	60.68	20.70	31
	Overweight (1)	62.10	27.40	33

Table 2 Tests of Between-Subjects Effects (main effects)

Source	Sum of Squares	<i>df</i>	Mean square	<i>F</i>	Sig.	Partial Eta Squared
Corr. Model	16708.116	12	1392.34	2.92	.001	.21
Intercept	2016.869	1	2016.86	4.23	.042	.03
SAQAVG	4399.559	1	4399.55	9.23	.003	.06
Sex	19.045	1	19.04	.04	.842	.00
Grade	725.316	2	362.65	.76	.469	.01
Group	1044.605	1	1044.60	2.19	.141	.01

There was a statistically significant grade x group interaction ( $F [2,129] = 6.48, p = .002, \eta^2 = .091$ ). The results of this study showed that the fourth graders had a higher step/min. in the group with the fit-appearing teacher and lower step/min. in the group with the overweight-appearing teacher. However, it was the opposite with the sixth graders, where the group with the fit-appearing teacher had lower step/min. Results for the interactions can be found in Table 3. The effect size of the interaction of grade on group is 9%, taken from the partial eta squared. This explains the proportion of variance that the variable explains, which is not explained by other variables in the analysis. The

Table 3 Tests of Between-Subjects Effects (interactions)

Source	Type III Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.	Partial Eta Squared
Sex*Grade	1146.849	2	573.425	1.20	.304	.018
Sex*Group	505.854	1	505.854	1.06	.305	.008
Grade*Group	6179.403	2	3089.702	6.48	.002	.091
Sex*Grade*Group	2106.165	2	1053.083	2.21	.114	.033
Error	61480.321	129	476.592			
Total	644470.642	142				
Corrected Total	78188.437	141				

pairwise comparisons for fourth grade yielded a medium effect size with Cohen's  $d = 0.39$ , and for sixth grade, a large effect size with Cohen's  $d = 0.89$ . Levene's test of equality of error variances was not significant ( $p = .966$ ), meaning that the group variances were equal and the assumption of homogeneity of variance has been met.

The teacher's steps from the pedometer were used to control for the teacher's activity levels. The teacher's step counts were divided by the time that the pedometer was worn, which resulted in a difference of 86.91 steps/min. for fit-appearing and 82.22 steps/min. for overweight-appearing.

Results for the one-way ANOVA tests examining Figure Rating Scale difference scores showed that there was a statistically significant difference between groups (weight bias and grade) as determined by the ANOVA ( $F [2,141] = 6.85, p = .001$ ). A Bonferroni post hoc test revealed that the change score was statistically significantly higher for fourth graders ( $2.06 \pm 1.31, p = .001$ ) compared to the fifth graders ( $1.35 \pm 1.98$ ) and

sixth graders ( $0.78 \pm 1.46$ ). There was no statistically significant difference between the fifth-grade and sixth-grade groups ( $p = .280$ ) and between the fourth-grade and fifth-grade groups ( $p = .091$ ). The one-way ANOVA test for change score and sex did not show statistical significance ( $p = .217$ ). *T*-tests results showed there was a statistically significant ( $p < .001$ ) difference in change score and these scores were higher for the overweight-appearing teacher ( $M = 4.01$ ,  $SD = .91$ ) compared to the fit-appearing teacher ( $M = 2.58$ ,  $SD = 1.16$ ). Results for the one-way ANOVA tests examining Student Attitude Questionnaire scores showed statistical significance by group for questions #1 ( $p = .034$ ), #4 ( $p < .001$ ), and #5 ( $p = .027$ ). Statistical significance was found by grade for question #2 ( $p = .011$ ). For sex, statistical significance was found for questions #1 ( $p < .001$ ), #2 ( $p = .028$ ), #4 ( $p = .019$ ), #5 ( $p = .001$ ), #6 ( $p = .041$ ), and #8 ( $p = .009$ ). Finally, for weight bias, statistical significance was found for question #3 ( $p < .001$ ). Results from these analyses can be found in Table 4. However, for the scope of the study,

Table 4 ANOVA Sig. Results for Student Attitude Questionnaire (SAQ)

	Group	Sex	Grade	Weight Bias
SAQ #1	.034	.000	.301	.540
SAQ #2	.276	.028	.011	.186
SAQ #3	.121	.211	.059	.000
SAQ #4	.000	.019	.925	.705
SAQ #5	.027	.001	.544	.946
SAQ #6	.626	.041	.751	.419
SAQ #7	.212	.235	.927	.509
SAQ #8	.248	.009	.971	.387

it is only applicable to focus on results by group because other variable means are across both group levels (i.e., fat suit and no fat suit).



## DISCUSSION

The purpose of this study was to examine how perceptions of a physical educator's physical appearance affected student physical activity levels through the use of pedometers. It was hypothesized that students with the fit-appearing teacher would have higher step counts than those students with the overweight-appearing teacher. The results of this study showed that the fourth graders had a higher step/min. in the group with the fit-appearing teacher and lower step/min. in the group with the overweight-appearing teacher. However, it was the opposite with the sixth graders, where the group with the fit-appearing teacher had lower step/min. than the group with the overweight-appearing teacher. The fifth graders did not significantly change. These results for the fourth graders are congruent with the Melville and Maddalozzo (1988) study, the Thomson (1996) study, and the Dean (2005) study, in the fact that they have more favorable results with the fit-appearing teacher. However, outcomes from this study might prove that physical appearance taken by itself may not be as important as teacher behavior, such as stated by Spencer (1998), where the actions of physical educators can model behavior patterns for their students for personal health and fitness.

The results indicated differences between fourth and sixth grades. This could possibly be in conjunction with the Theory of Cognitive Development (Piaget, 1936), which explains how children develop mentally with the increase of age. According to this theory, the formal operational stage begins at the age of 11 or 12 years old and initiates

the ability to think about abstract concepts and show change in cognitive capacity (Inhelder & Piaget, 1958). This could explain why the results of this study show that the fourth graders (aged 9-10) were more negatively affected than the fifth graders (aged 10-12) and sixth graders (aged 11-13) by the overweight-appearing teacher. The abstract concept in the case of this study could have been the overweight-appearing teacher looking unnatural and students beginning to question the authenticity of the fat suit more as student age increased. Alternatively, this could have also explained the cognitive capacity of the students and the lack of need to base individual behavior on a trait of another person as the student's age increased.

For the scope of the study, focus was placed on SAQ questions #1, the likeability of the teacher, and #4, the appearance of the teacher. This study produced an interesting difference in question #1, which asked students to agree or disagree with the statement "I think I would like having Coach T. as a physical education teacher." and then circle a corresponding number. The group with the fit-appearing teacher averaged a 3.81 score (all three grades collectively) and averaged a 4.22 score (all three grades collectively) for the overweight-appearing teacher with the results from the one-way ANOVA showing statistical significance ( $p = .034$ ). This result was not congruent with the hypothesis and with previous literature (Conlin, 2010; Dean et al., 2005; Melville & Maddalozzo, 1988) stating that an overweight-appearing teacher would have a lower score on this question. These results show that a fit physical appearance does not make a teacher more likeable.

On the contrary, the study also produced an interesting difference in question #4 on the Student Attitude Questionnaire, which asked students to agree or disagree with the statement "Coach T. appears physically fit." The group with the fit-appearing teacher

averaged a 4.49 score on that question (all three grades collectively), and then the group with the overweight-appearing teacher averaged a 3.82 score (all three grades collectively) with the results from the one-way ANOVA showing statistical significance ( $p < .001$ ). This result was congruent with the hypothesis and with previous literature (Conlin, 2010; Dean et al., 2005; Melville & Maddalozzo, 1988) stating that an overweight-appearing teacher would have a lower score on this question.

Although the Figure Rating Scale change score was not statistically significant in predicting steps/min., the change score produced noteworthy differences in scores that students chose and the weight bias that these scores represented in answer to the question “How good of a PE teacher do you think this person would be?” The averages for all grade levels and for both groups combined collectively resulted in a 4.01 score for the fit-appearing cartoon figure, and a 2.61 score for the overweight-appearing cartoon figure. These results were similar to other study suggesting that the overweight-appearing cartoon figure was less favorable (Tiggemann & Wilson-Barrett, 1998). The ANOVA results showed that the fourth graders had the greatest change score, which interprets as a higher weight bias. Therefore, the higher weight biased fourth graders had lower steps/min. with the overweight-appearing teacher compared to the sixth graders who had low weight bias and had higher steps/min. with the overweight-appearing teacher.

Although there was a trend favoring the fit-appearing teacher, according to the ANCOVA analysis, the weight bias was not a predictor of step counts/min. using the total sample, which was the focus of this study. The results of the Figure Rating Scale in this study were also congruent with results from the Lovell et al. (2013) study where athletes rated sport dieticians and found that nonobese sport dieticians were rated more positively

than obese sport dieticians. These results show that weight bias does exist in this population, but that the weight bias varies by grade level and does not always impact the physical activity behaviors of the students, which also aligns with the Theory of Cognitive Development (Piaget, 1936) where the cognitive development of the students increases with age. Weight bias had an opposite effect in sixth graders and this could be due to the teacher appearance not being the only variable to have an effect on physical activity levels in older children. This possibility aligns with the Social Learning Theory (Bandura, 1977), where teacher behavior and all related variables may have a greater influence on physical activity levels than physical appearance by itself.

Applying these results could mean that physical education teachers who have fourth-grade students (and possibly younger) would be able to have higher physical activity levels among their students if they were fit-appearing. The fourth-grade group also had higher weight bias, which creates an opportunity for teachers to reduce this weight bias through school programs (Irving, 2000; Puhl & Brownell, 2003).

The results could also apply to PETE programs who prepare teachers to teach fourth-grade level (and possibly younger) students at any point in their career. Some universities, in the past, have had requirements for their PETE program majors in regards to physical fitness: Brigham Young University (BYU) and Eastern Washington University (EWU), (Melville & Cardinal, 1988). These universities previously required certain fitness testing for students to either graduate from the program (BYU) or to be accepted into the program (EWU). These physical requirements, which possibly lead to having fit physical educators, could be revisited and benefit some students according to the results of this study and others previously mentioned.

Besides being a benefit to students taught by fit-appearing teachers, an application of the results of this study could also go towards the hiring process for physical educators. Administrators who knew that fit-appearing educators tend to bring more favorable results with students, whether it be for physical activity levels or cognitive skills, would then be able to make proper, professional judgments as they hire new physical education teachers onto their team (Melville & Cardinal, 1997; Jenkins, Caputo, & Farley, 2005). However, this could be a challenge in order to avoid blatant discrimination based on appearance. Instead, one option is for an administrator to request fitness testing be done before the hiring process begins and be given recommendations from PETE programs.

#### *Limitations, Application, and Conclusion*

The current study had limitations that could have influenced or changed some of the results. One such limitation was that the study was done at an elementary school in Utah and therefore generalizability cannot be assumed for other populations or age groups. Future research should include different age groups and student populations to incorporate the generalizability factor. Another limitation was that the students' current physical state was not measured or used as part of the study. This could have been beneficial and informative as to why student step counts and/or attitudes presented themselves, as was the case in other literature (Tiggemann & Wilson-Barrett, 1998).

Other limitations that this study faced was the inability to have repeated measures and randomization as options in order to create a stronger study. Repeated measures did not occur because the teacher could not teach the same students twice, once as

overweight-appearing and again as fit-appearing. The option to overcome this was to have two different teachers (similarly done in separate data collections by Conlin, 2010), but teacher behavior and/or teaching style would have been difficult to control for and could have changed the results (Buck & Teine, 1989). Therefore, to control for teacher lesson similarity, the teacher's step counts were measured using the pedometer. The teacher mentioned that wearing the fat suit hindered her more from moving as much, made her feel hot faster, made her adjust her shirt more to make sure the fat suit was not showing, and made her more tired, which could have changed student attitudes regarding behavior. According to Field (2013), randomization would have increased the internal validity of this study and eliminated more of the systematic variations through random grouping of participants.

This study could have had dissimilar results if the teacher had been male. Some studies suggest that females have different results for physical appearance rankings and evaluations than do males (Boor, Wartman, & Reuben, 1983; Buck & Teine, 1989). Hash et al. (2003) also stated that gender in their study with physicians' physical appearance could have been a source of bias. The aim of the present study was to give students the perception that the teacher was overweight; however, because she was female, she could have been thought of as pregnant by some students. This would not have been relevant if the teacher had been male and would have altered student attitudes toward the teacher and her appearance.

Future research needs to be conducted in this specific area employing a randomized experimental design and somehow perfecting the overweight perception for students using more natural looking fat suits. In addition, teacher activity level could also

be used as a predictor. By doing so, the literature could successfully conclude the effect of physical education teacher physical appearance on student physical activity.

Researchers should include different age groups such as middle school, high school, and possibly adapt for younger elementary-age students and create a generalizability option. Future studies should also try to use a male teacher to dispose of the perception that a female teacher might be pregnant as opposed to overweight.

This research should also be tested with different types of lesson topics because curriculum can be a crucial determinant of attitudes for students in physical education class (Luke & Sinclair, 1991) and sometimes students only feel successful when they are doing activities they already know how to do (Portman, 1995). Additionally, many other factors and variables can be used to aid in this area of research, such as student ethnicity or student fitness level. It would be interesting to see what these other circumstances could bring to the research realm. In order to get more of a general consensus of the weight bias and student perceptions, future research should include open ended questions on questionnaires and surveys of why students chose particular answers.

Although still applicable to this study because body composition is one component of physical fitness, the Social Learning Theory is behavior based and, therefore, should be examined in future studies to incorporate differences in activity level. An example of this is found in Bandura's idea of reciprocal determinism, where an individual's thoughts, behaviors, and environmental factors are conceptualized as a continuous interaction (Thompson, 2013). This idea could apply as physical appearance of a teacher being an environmental factor, while also incorporating a student's thought on the teacher's appearance and possibly as a reflection in the teacher behavior for the

student to model. Future research could benefit from allowing subjects to voice their thoughts on the teacher's appearance, but this might also require being deferential to the hypercritical task of commenting on another's appearance.

In conclusion, combatting obesity in children and adolescents can begin at school, and more specifically can happen during physical education classes. This study, in congruence with previous research aforementioned, concludes for some grade levels that the most ideal circumstances would bring a fit-appearing physical education teacher in as a successful candidate and a role model for physical appearance. However, it also suggests that physical appearance for other grade levels is not the most important characteristic in regards to increased physical activity. More research needs to be done in order to bridge this gap between conflicting results according to grade levels. More specifically, additional research needs to examine the physical activity levels of students as they relate to teacher appearance. This novel idea requires more empirical evidence to create a stronger foundational framework in the area of physical education teacher physical appearance.



## APPENDIX

## STUDENT ATTITUDE QUESTIONNAIRE

Please indicate by circling the appropriate number below each statement. Please remember there are no “right” or “wrong” answers. Your answers will remain confidential.

Use the following guide to show how you feel about the questions.

1 - strongly disagree

2 = disagree

3 = don't know or uncertain

4 = agree

5 = strongly agree

1. I think I would like having Coach T. as a physical education teacher.

1 2 3 4 5

2. Coach T. knows a lot about physical education.

1 2 3 4 5

3. A physical education teacher should be physically fit.

1 2 3 4 5

4. Coach T. appears physically fit.

1 2 3 4 5

5. I will try to use the information Coach T. talked about to improve my own physical fitness.

1 2 3 4 5

6. I believe Coach T. leads a healthy lifestyle.

1 2 3 4 5

7. I think Coach T. exercises regularly.

1 2 3 4 5

8. Coach T. motivates me to exercise and lead a healthy lifestyle.

1 2 3 4 5

### Figure Rating Scale

Name\_\_\_\_\_

Grade\_\_\_\_\_

Age\_\_\_\_\_

How good of a P.E. teacher do you think each of these people would be?

1= Very bad

2= Bad

3= Neither bad or good

4= Good

5= Very good



\_\_\_\_\_



\_\_\_\_\_



Figure 1 Fit-appearing female teacher



Figure 2 Overweight-appearing female teacher

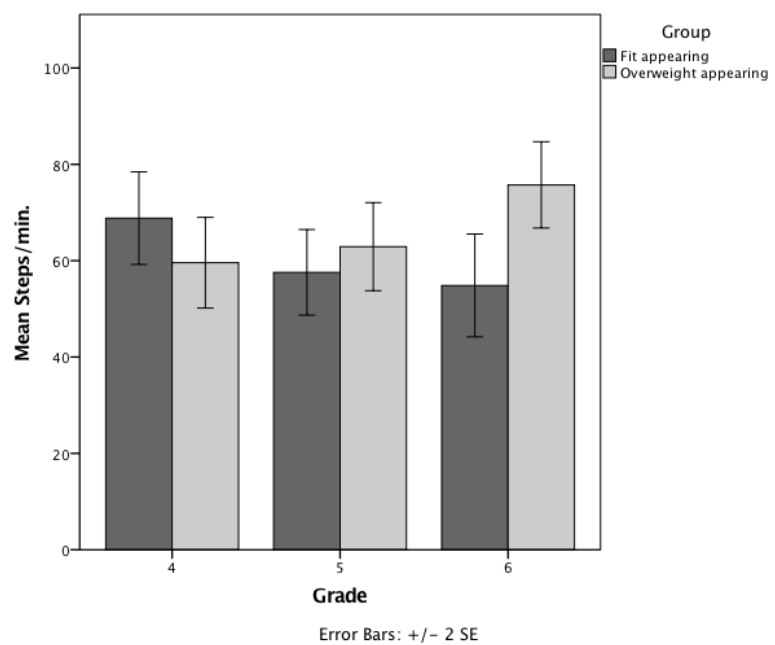


Figure 3 Mean steps/min. by grade and group

## REFERENCES

- Andreyeva, T., Puhl, R. M., & Brownell, K. D. (2008). Changes in perceived weight discrimination among Americans, 1995-1996 through 2004-2006. *Obesity, 16*, 1129-1134.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Behrens, T., Hawkins, S., & Dinger, M. (2005). Relationship between objectively measured steps and time spent in physical activity among free-living college students. *Measurement in Physical Education and Exercise Science, 9*, 67-77.
- Bishoff, J. A., Plowman, S. A., & Lindenman, L. (1988). The relationship of teacher fitness to teacher/student interaction. *Journal of Teaching in Physical Education, 7*, 142-151.
- Boor, M., Wartman, S. A., & Reuben, D. B. (1983). Relationship of physical appearance and professional demeanor to interview evaluations and rankings of medical residency applicants. *The Journal of Psychology, 113*, 61-65.
- Bryant, L. G., & Curtner-Smith, M. D. (2008). Impact of a physical education teacher's disability on elementary pupils' perceptions of effectiveness and learning. *Adapted Physical Activity Quarterly, 25*, 118-131.
- Cardina, C. E. (1994). *Social learning theory as a predictor of adolescents' physical activity behavior* (Unpublished doctoral dissertation). The Ohio State University, Ohio.
- Cardinal, B. J. (2001). Role modeling attitudes and physical activity and fitness promoting behaviors of HPERD professionals and preprofessionals. *Research Quarterly for Exercise and Sport, 72*, 84-91.
- Cardinal, B. J., & Cardinal, M. K. (2001). Role modeling in HPERD: Do attitudes match behavior? *Journal of Physical Education, Recreation, and Dance, 72*, 34-39.
- Cardinal, B. J., Cardinal, M. K., Drabbs, M. E., Krause, J. V., Maddalozzo, J. G., Martin,

- J. Melville, D. S., & Singleton, S. P. (1998). Preliminary development of a scale to measure attitudes regarding the importance of role modeling in physical activity and fitness behavior among health, physical education, recreation, and dance professionals. *Perceptual and Motor Skills*, 86, 627-630.
- Centers for Disease Control and Prevention (CDC) (2015). Obesity prevalence 2015. Retrieved on November 16, 2016 from <https://www.cdc.gov/obesity/data/prevalence-maps.html>.
- Centers for Disease Control and Prevention (CDC) (2016). Adult Obesity Facts. Retrieved on November 16, 2016 from <https://www.cdc.gov/obesity/data/adult.html>.
- Conlin, G. (2010). *Students' cognitive and attitudinal responses to average- and overweight-appearing physical education teachers* (Unpublished doctoral dissertation). The University of Utah, Utah.
- Crandall, C. S. (1994). Prejudice against fat people: Ideology and self-interest. *Journal of Personality and Social Psychology*, 66, 882-894.
- Dean, M. B., Adams, T. M., & Comeau, M. J. (2005). The effect of a female physical educator's physical appearance on physical fitness knowledge and attitudes of junior high students. *The Physical Educator*, 62, 14-25.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4<sup>th</sup> ed.). Thousand Oaks, CA: SAGE Publications Inc.
- Gold, R. R., Petrella, J., Angel, J., Ennis, L. S., & Woolley, T. W. (2012). The qualities of physical education teachers based upon students' perceptions of physical appearance. *Journal of Instructional Psychology*, 39, 92-104.
- Hash, R. B., Munna, R. K., Vogel, R. L., & Bason, J. J. (2003). Does physician weight affect perception of health advice? *Preventive Medicine*, 36, 41-44.
- Inhelder, B., & Piaget, J. (1958). *The growth of logical thinking from childhood to adolescence*. London: Routledge & Kegan Paul.
- Irving, L. M. (2000). Promoting size acceptance in elementary school children: the EDAP puppet program. *Eating Disorders*, 8, 221-232.
- Jenkins, A., Caputo, J. L., & Farley, R. S. (2005). Physical description and job attainment in physical education. *The Physical Educator*, 62, 96.
- Lovell, G. P., Parker, J. K., & Slater, G. J. (2013). Influence of female sports dietitians' physical characteristics on athlete perception of effectiveness. *International Journal of Sport Nutrition and Exercise Metabolism*, 23, 282-286.

- Lubker, J. R., Visek, A. J., Watson II, J. C., & Singpurwalla, D. (2012). Athletes' preferred characteristics and qualifications of sport psychology practitioners: A consumer market analysis. *Journal of Applied Sport Psychology*, 24, 465-480.
- Luke, M. D., & Sinclair, G. D. (1991). Gender differences in adolescents' attitudes toward school physical education. *Journal of Teaching in Physical Education*, 11, 31-46.
- Melville, D. S., & Cardinal, B. J. (1988). The problem: Body fatness within our profession. *Journal of Physical Education, Recreation, and Dance*, 59, 85-96.
- Melville, D. S., & Cardinal, B. J. (1997). Are overweight physical educators at a disadvantage in the labor market? A random survey of hiring personnel. *The Physical Educator*, 54, 216-221.
- Melville, D. S., & Maddalozzo, J. G. (1988). The effects of physical educator's appearance of body fatness has on communicating exercise concepts to high school students. *Journal of Teaching in Physical Education*, 7, 343-352.
- Mitchell, M. M. (2007). Choosing an active lifestyle: Don't do as I do; do as I say. *Journal of Physical Education, Recreation, and Dance*, 78, 4-6.
- Piaget, J. (1936). *Origins of intelligence in the child*. London: Routledge & Kegan Paul.
- Portman, P. A. (1995). Who is having fun in physical education classes? Experiences of sixth-grade students in elementary and middle schools. *Journal of Teaching in Physical Education*, 14, 445-453.
- Puhl, R. M., & Brownell, K. D. (2003). Psychosocial origins of obesity stigma: Toward changing a powerful and pervasive bias. *Obesity*, 4, 213-227.
- Schee, C. V., & Gard, M. (2014). Healthy, happy and ready to teach, or why kids can't learn from fat teachers: The discursive politics of school reform and teacher health. *Critical Public Health*, 24, 210-225.
- Spencer, A. (1998). Physical educator: Role model or roll the ball out? *Journal of Physical Education, Recreation, and Dance*, 69, 58-63.
- Stunkard, A., Sorenson, T., & Schulsinger, F. (1983). Use of the Danish Adoption Register for the study of obesity and thinness. In S. Kety, L. P. Rowland, R. L. Sidman, & S. W. Matthysse (Eds.), *The genetics of neurological and psychiatric disorders* (pp. 115-120). New York: Raven Press.
- Thomson, W. C. (1996). Apparent teacher fitness level and its effect on student test scores. *The Indiana Journal for Health, Physical Education, Recreation, and Dance*, 25, 17-20.



- Thompson, S. (2013). Social Learning Theory. In C. R. Reynolds, K. J. Vannest, & E. Fletcher-Janzen (Eds.), *Encyclopedia of special education: a reference for the education of children, adolescents, and adults with disabilities and other exceptional individuals* (4th ed.). Hoboken, NJ: Wiley.
- Tiggemann, M., & Wilson-Barrett, E. (1998). Children's figure ratings: Relationship to self-esteem and negative stereotyping. *International Journal of Eating Disorders*, 23, 83-88.
- Vincent, S. D., & Sidman, C. L. (2003). Determining measurement error in digital pedometers. *Measurement in Physical Education and Exercise Science*, 7, 19-24.
- Washington, R. L. (2011). Childhood obesity: Issues of weight bias. *Preventing Chronic Disease*, 8, 1-5.
- Webster, C. A., Webster, L., Cribbs, J., Wellborn, B., Lineberger, M. B., & Doan, R. (2014). The relationship between preservice teachers' health-related fitness and movement competency in gymnastics. *The Physical Educator*, 71, 203-217.
- Welk, G. L. (2002) *Physical activity assessments for health-related research*. Champaign, IL: Human Kinetics.
- Wilmore, J. H. (1982). Objectives for the nation – physical fitness and exercise. *Journal of Physical Education, Recreation, and Dance*, 53, 41-43.
- Zapka, J. M., Lemon, S. C., Magner, R. P., & Hale, J. (2009). Lifestyle behaviors and weight among hospital-based nurses. *Journal of Nursing Management*, 17, 853-860.